DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207-8175

REPLY TO
ATTENTION OF

CESAJ-PM-M

AUG 04 2016

MEMORANDUM FOR SEE DISTRIBUTION LIST

SUBJECT: Draft Final Technical Project Planning (TPP) Memorandum for the Remedial Investigation/Feasibility Study (RI/FS) at the Lower Camp Debris Site, Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Property No. I02PR0068, Culebra, Puerto Rico

The Jacksonville District, U.S. Army Corps of Engineers is enclosing for your review and comment the Draft Final TPP Memorandum for the RI/FS at the Lower Camp Debris Site associated with DERP-FUDS Property No. I02PR0068, Culebra, Puerto Rico.

Please provide your comments no later than September 4, 2016, to the Jacksonville District International and Interagency Branch at the address above. If we do not receive comments by this date, we will assume concurrence from your agency.

Should you need additional information, please contact Wilberto Cubero, Project Manager, at 904-232-1426 or by email at Wilberto.Cubero-delToro@usace.army.mil. You may also contact the undersigned at (904) 232-1758 or by e-mail at John.E.Keiser@usace.army.mil.

Sincerely,

Encl

John E. Keiser, P.E.
Program Manager, Formerly Used Defense Sites
Military/Interagency and International Services Branch

Distribution List Draft Final TPP Memorandum for RI/FS at the Lower Camp Debris Site, Culebra, Puerto Rico	
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Draft Final

Technical Project Planning Meeting Memorandum

Remedial Investigation/Feasibility Study

Lower Camp Camp Debris Site – Project Number I02PR006800

Culebra Island, Puerto Rico

August 2016

Prepared for:
U.S. Army Corps of Engineers

MEETING SUMMARY

Technical Project Planning Meeting Held May 18, 2016

ATTENDEES:	Becky Terry/USACE	Wilberto Cubero/USACE
	Marianne Gruber/USACE	Sarah Dyer/USACE
	Michelle Blackman/USACE	Tom Georgian/USACE (by phone)
	Gloria Toro Agrait/PREQB	Eduardo Gonzalez/EPA
	Craig Lilyestrom/PRDNER (by phone)	Lisamarie Carrubba/NOAA Fisheries
	Diane Wehner/NOAA NOS	Ana Roman/USFWS
	Ricardo Colon/USFWS	Cindy Martin/TRC Inc./PREQB Contractor
	Katarina Rutkowski/TRC Inc./PREQB Contractor (by phone)	Bryan Burkingstock/CH2M
PREPARED BY:	Bryan Burkingstock/CH2M	
DATE PREPARED:	July 28, 2016	
PROJECT:	Remedial Investigation/Feasibility Study Lower Camp Debris Site Culebra Island National Wildlife Refuge, Puerto Rico Contract No. W912DY-09-D-0060, Task Order No. 0004 FUDS Project No. I02PR006800	

Objectives

The overall objective of the technical project planning (TPP) process is to provide a comprehensive and systematic method for identifying project objectives and optimizing data collection, while taking into account stakeholder input. The anticipated results of the TPP meeting were as follows:

- Create an effective team, with open dialogue and communications, and document specific project objectives.
- Review data quality objectives (DQOs) and data collection approaches and options to achieve project closeout.
- Institutionalize site knowledge and approach.
- Introduce the team to the challenges of the site by conducting a site visit after the TPP meeting.

Summary

The TPP meeting was held on May 18, 2016 at the Juvenile Center in the Municipality of Culebra on the island of Culebra, Puerto Rico. This is the second TPP meeting for the site and necessitated due to the difficulties identified in the proposed work plan including sample area, sample location, and in general the technical approach to obtain Site closure. The sign-in sheet is provided as **Attachment A**. A summary of the notes collected during the TPP meeting and Lower Camp Debris (LCD) site visit are provided below.

Introductions:

- Wilberto Cubero/U.S. Army Corps of Engineers (USACE) introduced the Culebra team and clarified that the upland area (e.g. former Navy bathroom facility) is not part of the LCD site investigation.
- Bryan Burkingstock/CH2M HILL (CH2M) reviewed the Safety Brief for the site visit and led the PowerPoint presentation for the LCD site, which included a review of performance objectives, site description, existing data, data needs, technical approach, and reporting. The presentation, as it was presented, is provided as **Attachment B**.

General Comments, Issues, and Questions Raised During the Presentation:

- Compare sediment data from the *Site Investigation Report for the Culebra Island National Wildlife Refuge Site, Culebra Island, Puerto Rico* (Ecology and Environment, Inc. [E&E], 1996; 1996 Site Inspection Report) to ecological risk criteria. Ecological risk will drive the development of the remedy.
- Note that the LCD site currently is designated restricted use as a Resource Conservation and that no change in land use is anticipated.
- Consider the collection of discrete samples instead of the proposed composited samples, in accordance with Puerto Rico Environmental Equality Board (PREQB) and U.S. Environmental Protection Agency (EPA) Region 2 recommendations, and reduce the quantity of samples to 15 or less.
- Collect samples around the area with the highest metal deposition instead of collecting multiple samples within a "Decision Unit" outside the impacted area.
- Consider that the land crab breeding season is from July to September. The female land crabs digs a burrow and then closes the opening. The burrows and the female land crabs inside are not visible during this time period. USACE to coordinate with the Puerto Rico Department of Natural and Environmental Resources (PRDNER) prior to conducting fieldwork and sampling activities.
- Change language from "endangered" to "protected" species in the standard operating procedures (SOPs) developed for the Culebra FUDS projects.
- Consider collecting pore water sample(s) in the mangrove area. For groundwater, the team needs to demonstrate salinity content and poor yields (recharge rate is or is not high enough for potable use).
- Reduce the analytical list to only U.S. Department of Defense (DoD) metals based on current LCD site conditions and DoD past use.
- Note background locations will be relocated or removed (Sample Unit 4 [SU4]) based on group discussions.
- Consider alternative remedies for closure: propose an option that leaves limited areas of the significantly deteriorating metal debris in place, due to complexity and increased damage to the mangrove habitat area if removed. Resource agencies representatives noted the development of healthy mangroves trees in the area.

Presentation:

Slide 5:

Diane Wehner/National Oceanic and Atmospheric Administration (NOAA) National Ocean Service (NOS) asked whether the upgradient site (the former Navy bathroom facility and auto maintenance/recycle-waste collection center) is draining to the LCD site and whether there is sampling being conducted at the former Navy Bathroom facility. Wilberto Cubero/USACE indicated that there is a potential of drainage,

specifically surface water, from the former Navy bathroom facility/recycle-waste collection center area that could be migrating to the LCD site, but sampling at either location has not been conducted. The former Navy bathroom facility area is not within the current scope of work as others have used the facility subsequent to DoD operations, and are currently using that area. Diane asked if the upgradient site is under any investigation. Eduardo Gonzalez/EPA responded that EPA is not aware of any investigation. The site is under municipality control.

Slide 11:

Becky Terry/USACE clarified the 2011 Geophysical Survey (CH2M HILL, 2012) delineated the mangrove area boundary within the upland area. Cindy Martin/TRC Inc./PREQB Contractor requested that the septic tank be labeled on the figure. Bryan Burkingstock/CH2M concurred but noted the septic tank is outside the LCD area and that the investigation is focused only on the debris at the LCD site. The technical approach will have LCD site wells and background wells. Wilberto Cubero/USACE clarified that the USACE is not authorized to characterize sites used by non-DoD entities, so the USACE cannot investigate upgradient. Diane Wehner/NOAA NOS noted the importance of seeing how the upgradient site factors into the LCD site. Wilberto agreed that the USACE will use previous knowledge from the upgradient area as applicable and appropriate. Diane questioned that this investigation is driven by three sediment samples from E&E's 1996 Site Inspection report at the LCD site debris. Wilberto and Marianne Gruber/USACE answered "yes" but reiterated the USACE cannot investigate non-DoD use of a property. Eduardo Gonzalez/EPA expressed concern that the upland background samples may not be representative of the site.

Slide 16:

Diane Wehner/NOAA NOS asked whether detected metals had been compared to screening levels. Becky Terry/USACE stated there is no known comparison. The team did not know how the samples were previously collected, what quality control and quality assurance processes were completed, or what screening values were used. Cindy Martin/TRC Inc./PREQB Contractor noted that PREQB would have additional requests for certain analytes to be tested in the future.

Slide 28:

Cindy Martin/TRC Inc./PREQB Contractor asked for the rationale behind not collecting surface water samples. Bryan Burkingstock/CH2M stated when the tide recedes, there is no surface water. Cindy accepted this answer. Diane Wehner/NOAA NOS stated the mangrove habitat is adjacent to the site and asked whether there is potential for sampling water in the bay. Bryan noted the LCD site would be influenced by anyone using the bay, not just DoD-related sources.

Slide 29:

Eduardo Gonzalez/EPA asked on what basis the potential analytes of interest were selected? Bryan Burkingstock/CH2M stated the analytes of interest are based on historical site information, visual inspection, and analysis for DoD-related constituents.

Slide 31:

Diane Wehner/NOAA NOS asked what was located next to Sample Unit (SU) 5. Ricardo Colon/U.S. Fish and Wildlife Service (USFWS) and Ana Roman/USFWS clarified the buildings east and south of the SU were USFWS facilities and Authority of Conservation and Development for Culebra (ACDEC) buildings. Diane asked if anything upgradient from SU5 was draining to the SU. Bryan Burkingstock/CH2M said it is possible, but this area is a lower spot between to higher spots along a topographical ridge and overland flow would flow east and west from SU5. The SU5 area was unoccupied, grass covered open space from 1943 onward and no activities occurred in the area based on historical aerial photos. There is no indication of activities at SU3, SU4, or SU5 during DoD use.

Diane noted there were no discrete samples in the sample approach, and the USACE would need discrete samples for the screening level risk assessment (SLRA). In addition, Diane questioned the high number of samples and asked if composite sampling was appropriate. Decision unit (DU) and composite sampling would not be acceptable, because an average sample cannot be compared to a screening value. Therefore, a SLRA cannot be completed without discrete samples. Tom Georgian/USACE said the maximum value can be compared with screening levels and that one hit above screening levels does not indicate risk. Tom stated the dataset will have 15 concentration measurements with screening level exceedances compared to background. Diane stated if maximum composite is used, the worst case scenario cannot be measured. Diane recommended 15 discrete samples instead of 30. Tom stated it was more representative to composite 30 samples into 15 grabs. Katarina Rutkowski/TRC Inc./PREQB Contractor did not agree with compositing samples inside and outside debris piles to make a DU. Katarina supports taking more discrete samples or doing true incremental sampling. Katarina further stated she has not seen this approach used for a remedial investigation, does not agree with composite sampling, and wants the area where debris is located characterized as opposed to where the debris is not. Tom discussed the use of composites and Katarina suggested comments will be provided in the Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP). Tom had no objection to getting a larger unit of grabs and recommended 15 to 30 samples if the technical approach is not to composite any samples. The tentative resolution is to collect 15 discrete samples.

Diane wanted to make sure SU3 and SU4 are appropriate as background if there are non-DoD-related activities upgradient from the sample units. Diane stated SU5 could be used for soil background, but the USACE needed to select a new location for sediment background. Lisamarie Carrubba/NOAA Fisheries stated SU4 was not background, as building septic effluent flows in that area. Diane stated the existing facility could impact SU4, and she did not want other input into background SU areas. Diane recommended removing SU4 completely. Katarina did not agree with using SU5 as a background area and recommended using only SU3 as the background SU. Tom pointed out that background is not necessarily natural, but just the background for site use in that area (anthropogenic background). Katarina asked whether a monitoring well could be installed between SU2 and the septic tank, and Wilberto stated the USACE needs to have an internal discussion to determine if this request is within the bounds of the contract and authorized area.

Slide 32:

Ana Roman/USFWS was ‘concerned’ about the focus on endangered species and stated the field activities need to be careful and cognizant of all species because Culebra is a wildlife refuge. Recommended using the term “Protected Species” in all documents. Cindy Martin/TRC Inc./PREQB Contractor asked what ecological criteria we are working with and if there are any protective measures to be taken. Bryan Burkingstock/CH2M referred to the slide and confirmed that protective measures will be taken as needed. Lisamarie Carrubba/NOAA Fisheries asked why groundwater monitoring was being conducted and suggested just doing pore water sampling in sediment areas. Katarina Rutkowski/TRC Inc./PREQB Contractor stated groundwater is considered potable on Culebra and is connected to surface water. Katarina agreed with groundwater sampling. Lisamarie asked why groundwater sampling needs to be conducted now, and why not see what sampling shows first. Katarina will discuss with PREQB whether pore water can be used instead of groundwater and thinks this may be a reasonable approach. Cindy then stated SU1 and SU2 had many samples outside the debris-impacted area. Bryan stated these were randomly positioned in GIS. Lisamarie asked what time of year the field activities would be conducted since the land crab mating season is July to September. The field activities would need to be conducted around this time to avoid disturbing the female land crabs in the burrows or a special authorization from PRDNER would be required.

Slide 43:

Diane Wehner/NOAA NOS stated that as long as background locations are similar (hydrology, soils, etc.), more than one background location is not required. Diane stated the anthropogenic areas could be considered, but those background areas should not be impacted by the site or by obvious human impact (something known to be immediately nearby). The group discussed removing SU4. Diane asked to confirm that SU3 was consistent with the site geology, hydrology, etc. Eduardo Gonzalez/EPA asked about DQO 1, and if there is no risk, will there be no removal of metal debris? Bryan Burkingstock/CH2M stated potentially, but that would be considered during a feasibility study. Eduardo asked why old data cannot be used. Bryan stated that per PREQB, old data would not be used because of age and lack of result validation.

Cindy Martin/TRC Inc./PREQB Contractor ended the meeting with the understanding that not all issues had been resolved and that some recommendations would be provided by PREQB.

Post-LCD Site Visit Discussion:

- Change the UFP-QAPP prior to submission to the Stakeholders.
- Analyte list–chemicals of concern (COCs) were not confirmed. PREQB mentioned requesting the full list typical of screening landfill sites. However, after visiting the LCD site, PREQB is considering requesting a more appropriate COC list. Attendees agreed surface samples would demonstrate elevated metals concentrations. Appropriate clearing of surface area would be documented in order to obtain subsurface samples.
- Set up a webinar meeting in early June 2016 to continue discussion on outstanding issues.
- Send Action Items to Stakeholders in a timely manner.
- Discuss discrete versus composite sampling.
- Discuss pore water versus groundwater samples.
- Determine whether groundwater yield is too low or salinity too high to classify groundwater as potable.
- Discuss background area locations; SU3 may still be best background SU.

Action Items

- USACE to coordinate with PRDNER regarding the possibility of conducting soil sampling during the land crab breeding season (July–September). USACE has initiated coordination with PRDNER about this matter.
- USACE to coordinate a follow-up teleconference meeting to discuss the TPP team's recommendations on the following items. During the site visit, NOAA and PREQB recommended having a separate meeting with the appropriate agencies to discuss these items, get resolution, and provide/discuss their recommendations with USACE during the follow-up teleconference meeting.
  - Pore water versus groundwater samples
  - Discrete samples versus composite samples
  - Background sample location(s)

Attachment A

Meeting Sign-In Sheet

May 18, 2016 **Culebra, Puerto Rico: Lower Camp Debris Site - Technical Project Planning**

Name	Organization/ Job Title	Email Address	Phone Number
Gloria M. Toro-Agrait	PREQB / Env. Permits Officer	gloriatoro@jca.pr.gov	(787) 767-8181 x3586
Cindy Martin	TRC / Support to PREQB	cmartin@trcsolutions.com	978-656-3688
MARIANNE GRUBER	COE_JAX	MARIANNE.B.GRUBER@USACE.ARMY.MIL	
BECKY TERRY	USACE - Huntsville	Rebecca.K.Terry@USACE.Army.Mil	256-895-1788
Sarah Dyer	USACE - Huntsville	Sarah.e.dyer@usace.army.mil	256-895-5518
Michelle Blackman	USACE - Huntsville	michelle.blackman@usace.army.mil	256-895-2531
Wilberto Cubero	USACE	wilberto.cubero-ultoro@usace.army.mil	904-232-1426
Bryan Burkingstock	CH2M	bburking@CH2M.com	678-530-4062
Eduardo Gonzalez	USEPA-R2-CEPD	gonzalez.eduardo@epa.gov	(787) 977-5839
Lissamarie Carrubba	NOAA Fisheries	lissamarie.carrubba@noaa.gov	787-851-3700
Diane Wehner	NOAA NOS	diane.wehner@noaa.gov	240-338-3411
Ana M Roman	USFWS / Culebra NWR	ana_roman@fws.gov	787 396-7711
Ricardo J. Colón	USFWS / Culebra NWR	ricardo_colon-merced@fws.gov	787-378-6870
Tom Georgian	UCKCE		
Craig Lilyestrom	DNER		
Katarina	PREQB		

Attachment B

Hazardous, Toxic, and Radioactive Waste
Remedial Investigation/Feasibility Study
Lower Camp Debris Site (Project I02PR006800)
Culebra Island, Puerto Rico

TECHNICAL PROJECT PLANNING MEETING

May 18, 2016

US Army Corps of Engineers
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Agenda

- Purpose of the Technical Project Planning (TPP) Process
- TPP Team Personnel
- Performance Objectives
- Site Description
- Existing Data
- Data Needs
- Summary of Technical Approach (Data Collection)
- Reporting

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Meeting Purpose

The TPP process provides for a comprehensive and systematic planning process for identifying project objectives and optimizing data collection, while taking into account stakeholder input.

The four phase TPP process in accordance with Engineering Manual (EM) 200-1-2 provides guidelines for this process.

- Anticipated Meeting Results
  - Create an effective team, open dialogue and communications, and document specific project objectives
  - Review Data Quality Objectives (DQOs) and data collection approaches/options to achieve project close out.
  - Institutionalize site knowledge and approach

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TPP Team Personnel and Stakeholders

- Army (USACE)
  - Becky Terry
  - Wilberto Cubero
  - Marianne Gruber
  - Sarah Dyer
  - Paul DeMarco
- PREQB
  - Gloria Toro Agrait
- PR DNER
  - Craig Lilyestrom
- USFWS
  - Ana Roman
  - Marelisa Rivera
- NOAA NMFS
  - Lisamarie Carrubba
- NOAA OR&R
  - Diane Wehner
- USEPA
  - Julio Vazquez
- ACDEC (Culebra)
  - María Coral Sánchez Parrilla
- CH2M
  - Bryan Burkingstock

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Project Overview

- Intent of this project is to collect samples to assess impacts from former Navy operations which resulted in a project termed: Culebra HTRW - Lower Camp Debris (LCD) Site.
- This Remedial Investigation will focus on the LCD Site (0.35 acre) related to the debris identified during the Site Inspection (August 2011).
- The area upgradient of the LCD Site, which includes a concrete pad of the former Navy bathroom facility and the associated septic tank, has been used by the Department of Conservation as an automotive shop and more recently operated as a Vehicle Inspection Center and recycling waste collection facility and therefore, is not eligible for funding under the FUDs program.

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Project Objectives

- Characterize the distribution of HTRW constituents associated with Department of Defense (DoD) past use of the site above risk-based concentration levels and collect adequate data to conduct a baseline risk assessment.
- Evaluate data against risk based concentration levels.
- Characterize background levels in mangrove habitat sediments, surface soil from upland areas, and in groundwater for comparison with levels detected in LCD Site media.
- Complete a remedial investigation to gather information sufficient to support an informed risk management decision regarding which remedy appears to be most appropriate for the LCD Site.

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Project Performance Objectives

- Complete a Remedial Investigation (RI)
- Conduct an Ecological Survey
- Conduct a Wetland Delineation Study
- Complete a Feasibility Study (FS) that will include the development and screening of alternatives and a detailed analysis of alternatives in order to choose an appropriate remedy to manage site risk

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Location of Culebra

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Location of Site

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Historical Area Photo

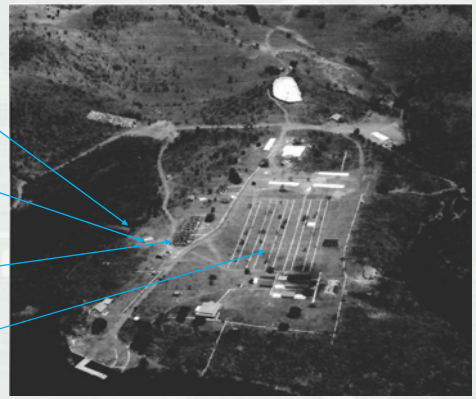
Photo taken on September 1943. *Source unknown.*

LCD Site

Bathroom Facility Septic Tank

Bathroom Facility

Rows for Military Tents



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Lower Camp Debris Site

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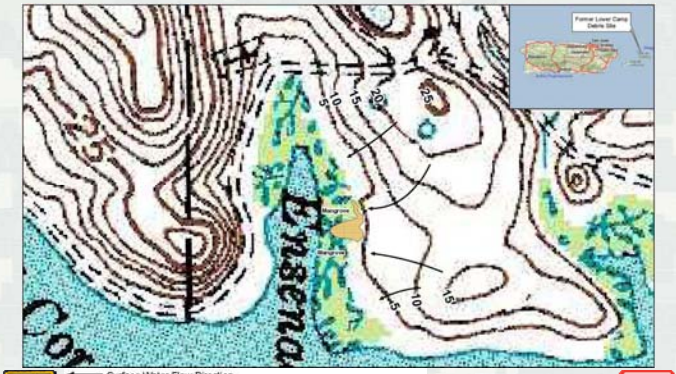
Topography of Area



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Existing Data

1) 1996 – LCD Site Inspection Report by Ecology and Environment, Inc.

2) 2011 – LCD Site Inspection Report by CH2M HILL

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Existing Data (continued)

1) <u>In July 1996, Ecology and Environment, Inc. (E&E) performed a CERCLA Site Inspection (SI) at the Former LCD Site</u>.

The SI consisted of the following:

- visual inspection
- installation of three soil borings and a temporary well within the mangrove habitat in an area of most concentrated debris
- "biased" samples were collected

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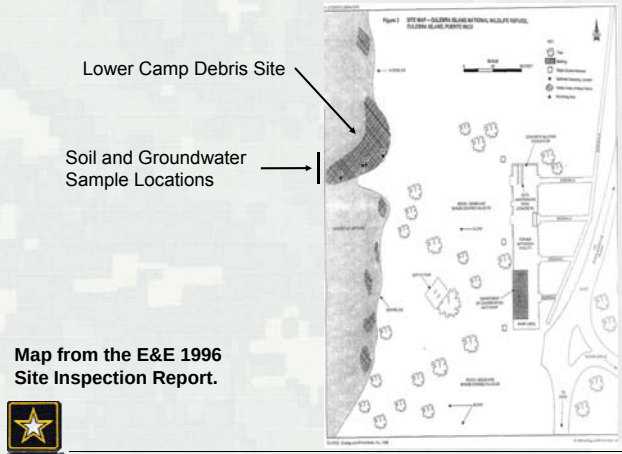
Existing Data (continued)



Map from the E&E 1996 Site Inspection Report.

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Existing Data (continued)

1) <u>E&E Site Inspection (July 1996) - Analytical Data</u>:

- <u>Two sediment samples and one groundwater sample were collected</u> and analyzed for purgeable aromatic hydrocarbons, purgeable aromatic halocarbons, ethylene dibromide (EDB), polynuclear aromatic hydrocarbons (PAHs), total recoverable petroleum hydrocarbons (TRPHs), and eight metals (arsenic, barium, cadmium, total chromium, lead, selenium, silver, and mercury).
- **<u>Sediment samples</u>: Six metals (arsenic, barium, chromium, lead, selenium, and mercury), TRPHs, and benzo(k)fluoranthene were detected.**
- **<u>Groundwater sample</u>: Six metals (arsenic, barium, chromium, lead, selenium, and mercury) were detected in the unfiltered water sample; however, only low concentrations of dissolved barium and lead were detected in the filtered water sample. No organics were detected.**

PREQB recommendation from the Final Site Inspection Report (CH2M HILL, July 2012):

Analytical data generated during the RI will completely replace the use of analytical data from the Site Investigation Report prepared by E&E. All E&E SI Report analytical data will be excluded from subsequent site evaluations, risk assessments, etc.

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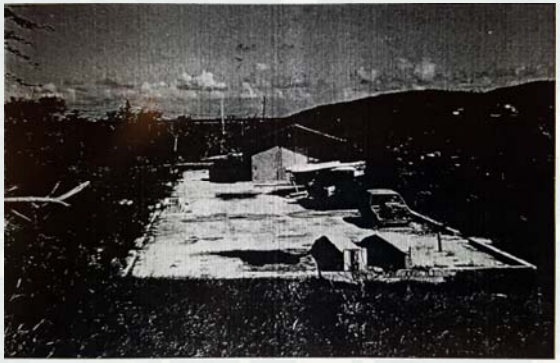
Existing Data (continued)

Former Navy bathroom facility pad being used by the Department of Conservation as an automotive shop. (Photo taken on July 19, 1996 [E&E])



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Existing Data (continued)

2) <u>In August 2011, CH2M HILL personnel conducted CERCLA SI field activities at the LCD Site that consisted of a site walk and geophysical survey</u>.

- Ground penetrating radar (GPR) scans were not possible in the mangrove because of the density of the vegetation.
- GPR scans performed along a former road bed and along the edge of the mangrove habitat did not reveal any anomalies inconsistent with site soil conditions.
- Estimated extent of debris was located in a total area of 0.35 acre and extended a distance of 350 feet from the southernmost to the northernmost tip of the debris field.
- Information regarding the type, location, and extent of debris at the LCD Site indicated the debris areas identified in the 1996 SI were still present.

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Existing Data (continued)

2) <u>CH2M HILL Site Inspection (August 2011) – Visual Observations</u>

Surficial debris:

- broken bottles
- building materials (bricks and mortar)
- oxidized metal (pipes, beams, rods/rebar, bolts, mattress springs, cables, water valves, cans)
- rusted metal walk way sheets
- rusted appliances (refrigerator type)
- rusted corrugated metal sheets
- concrete storm water pipes
- various vehicle parts (old engines, a battery, tires, axles, transmissions, body frames)
- broken porcelain.

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Existing Data (continued)

Lower Camp Debris Site: Visual Observation Results *(from CH2M HILL 2012 SI Report)*

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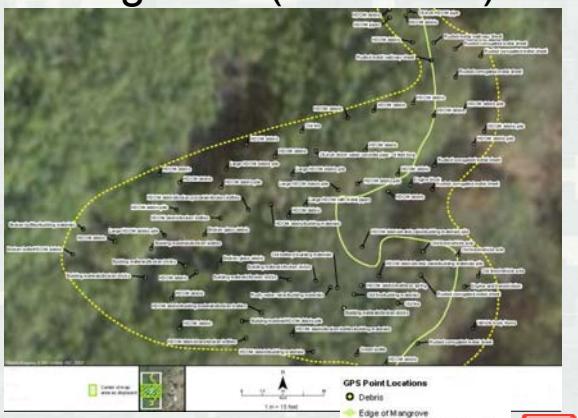
Existing Data (continued)

Lower Camp Debris Site: Visual Observation Results ***(from CH2M HILL 2012 SI Report)***



Imagery Source: World Imagery, ESRI Online v92, 2007

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Existing Data (continued)

Lower Camp Debris Site: Visual Observation Results ***(from CH2M HILL 2012 SI Report)***

Not included in the RI: These individual items appear to be newer in age (likely storm debris).

Imagery Source: World Imagery, ESRI Online v92, 2007

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Existing Data (continued)

Lower Camp Debris Site: <u>Visual Debris</u> ***(from CH2M HILL 2012 SI Report)***

(Photo taken by CH2M HILL personnel on August 15, 2011)

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Existing Data (continued)

Lower Camp Debris Site: <u>Visual Debris</u> ***(from CH2M HILL 2012 SI Report)***

(Photo taken by CH2M HILL personnel on August 15, 2011)

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Existing Data (continued)

Lower Camp Debris Site: Visual Debris ***(from CH2M HILL 2012 SI Report)***

(Photo taken by CH2M HILL personnel on August 15, 2011)

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Existing Data (continued)

Area Upgradient of the LCD Site

- Based on historical photographs, housing was arranged in a "tent city" format with the bathroom facility being one of the only permanent visible structures.
- The upland area upgradient of the LCD Site currently includes a concrete pad of the former Navy bathroom facility and the associated septic tank.
- The E&E 1996 Site Inspection Report indicated the concrete pad of the former Navy bathroom facility has been used by the Department of Conservation as an automotive shop subsequent to DoD property transfer.
- In addition, a recent LCD site visit conducted by USACE personnel revealed the concrete pad of the former Navy bathroom facility has been used as a Vehicle Inspection Center and is currently being used as a recycling waste collection facility.

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Existing Data (continued)

Former Navy bathroom facility pad being used as a Vehicle Inspection Center and a recycling waste collection facility. (Photo taken by USACE personnel on November 5, 2015)

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Investigation Data Needs

- Characterize site hydrology, including depth to groundwater, hydraulic gradient, groundwater flow rate, and geology.
- Define extent of DoD-related soil and groundwater contamination by determining the mean concentrations at each decision unit. The Sampling program will be further explained by randomly collecting systematic samples within and immediately downgradient of the potential source area (LCD Site), and identifying potential exposure related risks as part of the RI.

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Remedial Investigation Objectives

1) Identify the potential constituents of interest (PCOIs) that may have been released to the Lower Camp Debris Site due to DoD operations.
2) Characterize the distribution of the PCOIs in sediment (mangrove habitat), surface soil, and groundwater.
3) Characterize background concentrations of the PCOIs in sediment (mangrove habitat), surface soil, and groundwater.
4) Use data to complete FS as necessary.

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Technical Approach

The original UFP-QAPP (January 2014) has been revised based on available information related to past DoD operations, internal comments from the USACE Environmental and Munitions Center of Expertise (EM CX), and comments from other stakeholders.

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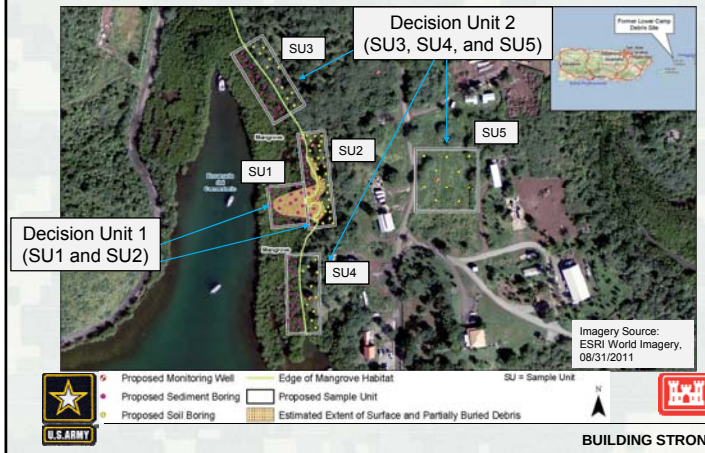
Decision Units/Sample Units



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Data Collection

- An Ecological Survey and Wetland Delineation will be conducted prior to field activities.
- Minimal impact or clearance of vegetation will be incorporated into the execution of the field activities.
- Culebra SOPs for Endangered Species Conservation and their Habitat will be followed during fieldwork activities.

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Data Collection (continued)

Lower Camp Debris Site – Ecological Survey

- Conduct an Ecological Survey of the LCD Site prior to field activities to document the site-specific ecology and presence/absence of rare, threatened, and endangered species both by a field survey and local and published resources.
- USACE will coordinate with FWS and PRDNER staff prior to clearing and drilling activities to identify appropriate habitat protection and conservation measures.
- CH2M Project Ecologist will conduct a field survey.
- The ecological survey results will be presented in the RI report as an appendix and the receptors identified will be discussed in the ecological risk assessment.

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Data Collection (continued)

Lower Camp Debris Site – Wetland Delineation

- Conduct a wetland delineation following procedures set forth in the Corps of Engineers Wetland Delineation Manual [Environmental Laboratory, 1987] and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Caribbean Islands Region (Version 2.0) [May 2011].
- Wetland delineation will extend 100 feet past either end of the LCD Site and data on vegetation, hydrology, and soils from points on either side of the wetland boundary will be collected.
- Data points will be collected every 100 feet or when habitat type changes.
- An Approved Jurisdictional Determination will not be conducted/completed.

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Data Collection (continued)

- Hand auger method will be used to *collect sediment and soil samples* in both the mangrove habitat sub-area and upland sub-area.
- Hollow stem auger (HSA) drilling methods will be used to advance soil borings at locations for groundwater *monitoring well installation* in the upland sub-area.

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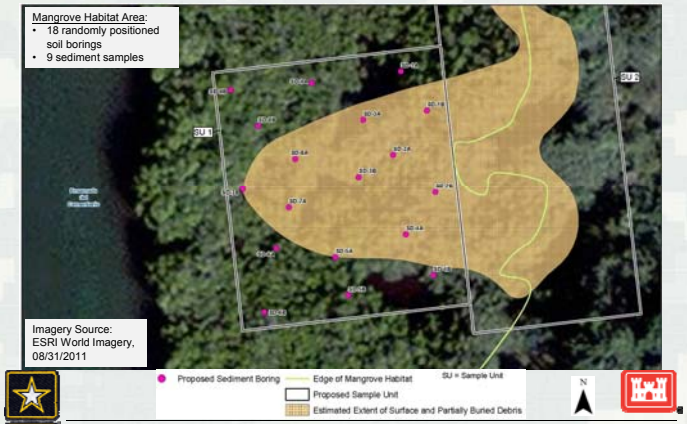
LCD Site - Sample Unit 1



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LCD Site - Sample Unit 2

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Data Collection (continued)

Sampling Unit	Medium	Sample Depth (feet bgs)	Sampling Method	Number of Samples	Analytical Parameters
SU1	Sediment	0-0.5 foot (0.5-1 foot for VPH)	Composite (grab for VPH)	9	PAHs, PCBs, TAL metals, AVS/SEM Metals, VPH/EPH, TOC, and grain size
SU2	Sediment	0-0.5 foot (0.5-1 foot for VPH)	Composite (grab for VPH)	6	PAHs, PCBs, TAL metals, AVS/SEM Metals, VPH/EPH, TOC, and grain size
	Surface soil	0-1 foot unless crab habitat is identified; then 0-2 feet	Composite (grab for VPH)	15	PAHs, PCBs, TAL metals, and VPH/EPH
	Groundwater	Variable	Grab	4	PAHs, TAL metals (filtered/unfiltered), VPH/EPH, pH, chloride, TDS, and salinity

SU1 – Mangrove Habitat within Debris Area (LCD Site)
SU2 – Mangrove Habitat and Upland Area within Debris Area (LCD Site)

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Background - Sample Unit 3

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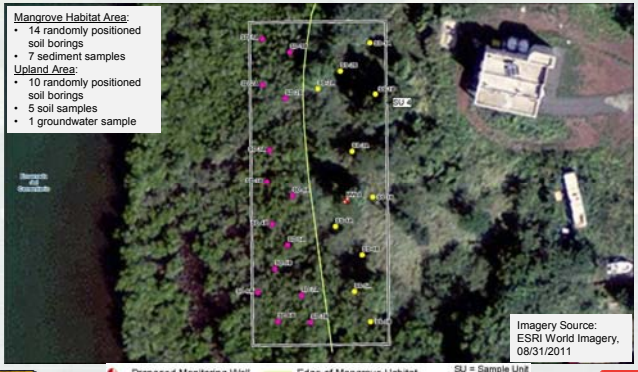
Background - Sample Unit 4



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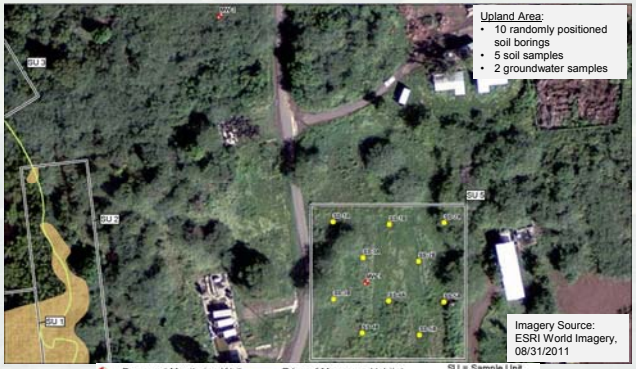
Background - Sample Unit 5



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Data Collection (continued)

Sampling Unit	Medium	Sample Depth (feet bgs)	Sampling Method	Number of Samples	Analytical Parameters
SU3 (Figure 13)	Sediment	0-0.5 foot	Composite	8	PAHs, TAL metals, TOC, and grain size
	Surface soil	0-1 foot unless crab habitat is identified; then 0-2 feet	Composite	5	PAHs and TAL metals
	Groundwater	Variable	Grab	1	PAHs, TAL metals (filtered/unfiltered), pH, chloride, TDS, and salinity
SU4 (Figure 14)	Sediment	0-0.5 foot	Composite	7	PAHs, TAL metals, TOC, and grain size
	Surface soil	0-1 foot unless crab habitat is identified; then 0-2 feet	Composite	5	PAHs and TAL metals
	Groundwater	Variable	Grab	1	PAHs, TAL metals (filtered/unfiltered), pH, chloride, TDS, and salinity
SU5 (Figure 15)	Surface soil	0-1 foot unless crab habitat is identified; then 0-2 feet	Composite	5	PAHs and TAL metals
	Groundwater	Variable	Grab	2	PAHs, TAL metals (filtered/unfiltered), pH, chloride, TDS, and salinity

SU3, SU4, and SU5 – Background Sample Units Outside Debris Area

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Data Quality Objectives

- **DQO 1:** If the soil/sediment and groundwater data indicate lateral and/or vertical contamination whose concentrations are below current EPA RSLs, and within acceptable limits of risk-based levels protective of human health and the environment, then USACE will recommend for no further investigation or action under the No Department of Defense Action Indicated (NDAI).
- **DQO 2:** If the soil/sediment and groundwater data indicate lateral and/or vertical contamination whose concentrations are above current EPA RSLs, and/or risk-based levels protective of human health and the environment, then results will be compared to background data and a risk assessment will be conducted in accordance to USACE and CERCLA guidelines to evaluate potential exposure related risks.
- **DQO 3:** If the soil/sediment and groundwater data indicate human health risks above acceptable limits and/or ecological risks above screening level risks, then additional sampling to refine the risk assessments or alternatively, remedial alternatives will be presented and analyzed as part of the FS implementation for the LCD Site.

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Reporting

- Remedial Investigation Report
- Feasibility Study Report
- Proposed Plan
- Decision Document

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Preliminary Project Schedule

- May 18, 2016 – TPP Meeting on the Revised Technical Approach
- June 2016 – Submittal of Draft Final UFP-QAPP for Regulatory Review
- July 2016 – Conduct Field Activities
- January 2017 – Final TPP Meeting to Discuss the Remedial Investigation Results
- March 2017 – Submittal of Draft Final RI Report for Regulatory Review

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